5. (Twice Amended) A method for manufacturing a martensitic stainless steel with high strength and high corrosion resistance comprising the steps of:

casting a stainless steel that comprises less than 0.06 wt.% C, less than 2.5 wt.% Si, less than 2.5 wt.% Mn, 1.0-6.0 wt.% Ni, 10.0-19.0 wt.% Cr, 0.5-6.0 wt.% W, less than 3.5 wt.% Mo, less than 0.5 wt.% Nb, less than 0.5 wt.% V, less than 3.0 wt.% Cu, 0.11-0.25 wt.% N, and the remainder being Fe and minor impurities; and

submitting the cast stainless steel to an austenization heat treatment at a temperature of 800-1150°C and/or tempering the stainless steel at a temperature of 350-575°C.

7. (Twice Amended) A method for manufacturing a martensitic stainless steel with high strength and high corrosion resistance comprising the steps of:

casting a stainless steel that comprises less than 0.06 wt.% C, less than 2.5 wt.% Si, less than 2.5 wt.% Mn, 1.0-6.0 wt.% Ni, 10.0-19.0 wt.% Cr, 0.5-6.0 wt.% W, less than 3.5 wt.% Mo, less than 0.5 wt.% Nb, less than 0.5 wt.% V, less than 3.0 wt.% Cu, 0.11-0.25 wt.% N, and the remainder being Fe and minor impurities;

mechanically-processing the stainless steel such that work hardening is generated in the stainless steel; and

submitting the mechanically-processed stainless steel to an austenization heat treatment at a temperature of 800-1150°C and/or tempering the stainless steel at a temperature of 350-575°C.